# SOME EXPERIMENTS WITH HYBRIDS.

BY CAROLINE GRAY SOULE, BROOKLINE, MASS.

In 1906 I had many cocoons of larvae from *Cynthia* ♀ by *Promethea* ♂. In 1907 the moths emerged, and were hardly distinguishable from pure *cynthia*, though careful examination showed a duskier tint on the wings and a tendency toward the breaking into oblong patches of the inner marginal line on the hind wings. This however does not mean as much as the color difference, for some *cynthia* have the line more or less broken. The moths were as disappointing as the larvae had been, in following the *cynthia* marks so closely, and confirmed my belief that *cynthia* is prepotent in cross with any other species, though I have not been able to get moths from any other cross.

On May 30th, two pairs of the hybrid moths mated, the eggs hatched on June 19th, and the larvae lived through the third moult, dying, apparently from mere lack of vigor or "vitality."

On June 7th, two pairs mated, the eggs hatched on June 24th, and the larvae died in moulting for the third time.

On June 10th, two pairs were mated all night and until dark June 11th, but no eggs were laid. They remated on June 12th, no eggs being laid till June 15th. These hatched, the weather being very hot, on June 24th. The larvae died in moulting for the third time.

June 19th, one pair mated, but no eggs were laid.

The larvae were typical *cynthia* in looks, and very delicate. I had no ailanthus for them, but they ate wild cherry voraciously, preferring it to lilac or ash. Something was amiss with the cherry, in Tyson, Vt., this year, and I found several larvae of *promethea*, *polyphemus* and *excaecatus*, hanging from twigs limp and lifeless, just as my hybrids hung in my tins. Indeed I have never before found as many dead larvae as this year, and nearly all on wild cherry.

On May 19th, ♀ *polyphemus* mated with ♂ *promethea* for several hours, and laid many eggs which did not hatch.

May 22d, ♀ *promethea* mated with a ♂ hybrid (*cynthia* ♀ and *promethea* ♂) but laid no eggs.

May 23rd, ♀ hybrid mated with ♂ promethea, but laid no eggs.

May 27th, ♀ *cynthia* and ♂ cecropia mated, eggs were laid, and they remated on the 28th, more eggs were laid, but all were infertile.

May 27th, ♀ *R. jorulla* and ♂ *cecropia* mated; many eggs were laid but proved infertile.

May 28th, ♀ hybrid mated ♂ *promethea* but the many eggs were infertile.

May 30th, ♀ hybrid and *promethea*, no eggs.

" " ♀ *cecropia* and ♂ *jorulla*, many infertile eggs.

May 31st, ♀ hybrid mated ♂ *promethea* but the eggs failed to hatch.

June 3rd, another similar pair mated but no eggs were laid.

June 14th, ♀ *polyphemus* mated ♂ *promethea* and laid many eggs, infertile.

June 16th, ♀ *promethea* and small ♂ *cecropia* mated. Over 200 infertile eggs were laid, and the pair mated a second time. No eggs.

June 17th, another similar pair, with many infertile eggs.

June 17th, ♀ *promethea* mated ♂ hybrid, many eggs were laid; remated, and more eggs were laid, all infertile.

June 29th, ♀ *H. budleyi* and ♂ *cynthia* mated, a few infertile eggs were laid.

July 3rd, ♀ *cynthia* mated ♂ *budleyi*, many infertile eggs were laid.

June 19th, ♀ *jorulla* mated ♂ *promethea* and laid many infertile eggs.

June 20th, ♀ *jorulla* and ♂ *cecropia*. Many infertile eggs.

June 22d, ♀ *promethea* mated ♂ *jorulla* and laid infertile eggs.

June 23rd, ♀ *jorulla* mated ♂ *promethea* and laid many infertile eggs.

As in former experiments my results differ from Mr. Joutel's, in that my moths seem to mate more readily, and to oviposit, in most cases, more freely.

June 29th, ♀ *cynthia* mated ♂ *budleyi* and laid many eggs, two of which hatched on July 21st, but died before moulting.

July 3rd, ♀ *budleyi* and ♂ *cynthia* mated, a few infertile eggs.

July 9th, two pairs ♀ *cynthia* mated *promethea* ♂♂ attracted by a ♀ *promethea* near the window.

Fertile eggs resulted but the larvae died from the cherry.

July 18th, ♀ *promethea* mated ♂ *S. gordius*, apparently normally, and laid many infertile eggs.

From this experience I think that *cynthia* and *promethea* will mate any other species, and *cecropia* has mated with every species provided so far.

*Polyphemus* ♂♂ have been attracted to a dark window by ♀♀ of *cynthia*, *promethea*, and *cecropia* on several occasions, no ♀ of their own kind being in the room.

# A REVIEW OF THE GENUS CHRYSOPHANUS.

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For some time the writer has been accumulating material in this genus with a view of monographing. Identifications of the various species of some genera of our *Rhopalocera* are often quite impossible, owing to the lack of necessary literature, so widely scattered. This is especially true in the west, where good entomological libraries are so rare. The writer believes that, if those who were working on any special genus or genera, would publish their results with the more important references, etc., our faunal knowledge would soon become much better known. In order to straighten out the present genus, the writer desires to obtain by purchase, exchange or loan, specimens of all our *Chrysophanids* from various localities. Immature stages, aberrations, minor variations, and specimens of *zeroe* and the *hypophlœas* group, are especially desirable. The genus *Chrysophanus* is now divided into six genera, several more or less superficial, viz.: *Tharsalea, Gaeides, Chrysophanus, Epidemia, Heodes* and *Chalceria,* but for convenience in the following brief synopsis, the species are listed under the one genus.

1. *arota,* Boisd. This species is known, so far, only from California. It flies quite commonly in the vicinity of San Francisco Bay. It is closely allied to *virginiensis,* Edwards and may prove conspecific with it. Dyar has partially described the preparatory stages. The larva feeds on *Ribes.*

2. *virginiensis,* Edwards. Found at high altitudes in Colorado, Nevada and California. Common at Lake Tahoe. Nothing is known of the early stages.

3. *hermes,* Edw. *Hermes* is a rare species and is not very well known. It appears to be rather abundant at San Diego, California and is also reported from Nevada. Wright (Butterflies West Coast) redescribes it as *del-sud,* the specimens coming from the type locality.

4. *xanthoides,* Boisd. Another Californian species and the largest in North America. It was recently, however, discovered at Calgary, Canada. I have it from many localities in California and it is evidently widespread in its distribution there, occurring more commonly at fairly high altitudes. Boisduval, (Lep. de la Californie) writes "Montagnes de la Californie. Rare." Henry Edwards has described the egg.

5. *dione,* Scudder. Ranges from Iowa to Kansas, and is also found in Nebraska, Montana, Manitoba, and Colorado. It comes very close to *xanthoides*